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Appl. No. **10/734,318**
Amdt dated January 3, 2007REMARKS/ARGUMENTSClaim Rejection — 35 U.S.C. §102

Claim 1 was rejected to for being anticipated under 35 USC §102(e) by US Patent 6,821,689 granted to Pierrat. The only explanation provided in the Office Action for this rejection was "Pierrat teaches the invention as claimed (see claims)." This rejection is respectfully traversed for several reasons as discussed below.

Firstly, this anticipation rejection is improper, because as stated in MPEP 707.07(d):

An omnibus rejection of the claim "on the references and for the reasons of record" is stereotyped and usually not informative and should therefore be avoided.

Since the Office Action does not contain a one-to-one mapping between limitations of Applicant's Claim 1 and citations to Pierrat's patent, Applicant submits that this rejection constitutes an "omnibus" rejection. Hence, the Office Action fails to make a prima facie case of anticipation.

The failure of the Office Action to provide a pin-point citation for each limitation in Applicant's Claim 1 makes it difficult to file a suitable response. The undersigned has made an effort to respond below to the current Office Action, based on an assumption that Pierrat's Claim 1 is cited against Applicant's Claim 1.

It is unclear from the Examiner's explanation (quoted in the first paragraph of this page of the Amendment), as to whether or not Pierrat's second mask is being analogized to Applicant's complementary mask. Assuming that this is the analogy being made, the Examiner has not shown where does Pierrat teach "identifying ... a plurality of critical openings" and "determining a threshold intensity ... through the plurality of critical opening." As noted by the Court of Appeals for the Federal Circuit:

"The identical invention must be shown in as complete detail as is contained in the ... claim."
Richardson v. Suzuki Motor Co., 868 F.2d 1226,
1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

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Accordingly, this is a second reason to traverse the anticipation rejection of Claim 1.

Thirdly, Pierrat's Claim 1 identifies an issue arising when "the space not print reliably when exposed through the phase shifting mask alone;" and solves this issue by "exposing the photoresist layer through the second mask, wherein the exposure through the second mask assists in exposing the space between the first feature and the second feature so that the space prints reliably".

This generic teaching by Pierrat, of using a second mask, fails to anticipate an issue of poorly defined regions that can arise *even when using* two masks as generically described in Pierrat's Claim 1. This problem, which arises from use of the two masks, is addressed by several explicit limitations recited in Applicant's Claim 1, e.g. determining a threshold intensity, for critical openings. The Office Action does not show where does Pierrat's Claim 1 teach such limitations being claimed by Applicant (either explicitly or inherently).

Note, in this context, that use of a complementary mask (or trim mask) with a phase shifting mask was generically described by Applicant in paragraph [0006] on page 2 of the Applicant's specification. Note further that Applicant described the above-mentioned problem with this technique, in Applicant's paragraphs [0007]-[0009] on pages 3 and 4.

In view of the above remarks, Applicant respectfully requests the Examiner to withdraw the §102 rejection of Claim 1. Claims 2-4, 6, 7 and 23 depend from Claim 1 and are therefore patentable over Pierrat's patent for at least the same reasons as those discussed above for Claim 1.

Claim Rejections – 35 U.S.C. §103

Claims 1-7 and 23-26 were also rejected under 35 U.S.C. §103(a), for being obvious over the teachings of Pierrat in US Patent 6,821,689 (which is discussed above), in view of Tsudaka's US Patent 5,825,647 and Cote et al's US Patent 6,787,271. This rejection is also traversed for a number of reasons.

Firstly, In explaining the obviousness rejection, the Office Action summarizes Applicant's claims in page 3 and top of page 4 of the Office Action. This summarization is respectfully traversed, as constituting an omnibus rejection. As stated in MPEP 707.07(d):

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A plurality of claims should never be grouped together in a common rejection, unless that rejection is equally applicable to all claims in the group..

Since the Office Action does not contain a one-to-one mapping between individual limitations of Applicant's Claim 1-7 and 23 and pin-point citations to the three patents combined by the Examiner, Applicant submits that this rejection is once again improper.

Secondly, the summarization of Applicant's claims in the Office Action is replete with errors and omissions which cannot be relied upon for examination. For example, page 3 of the Office Action fails to indicate that Applicant's Claim 1 requires wherein a pattern represented by said data of the complementary mask defines a number of openings that expose unwanted photoresist located between regions exposed via the phase shifting mask during the sub-wavelength photolithographic process. Moreover, the Office Action states in the middle of page 3 that the claimed invention requires wherein modifying comprises: increasing the area of at least one cut, and the increase in area is proportional to the difference between: a maximum intensity of the opening prior to increasing; and said threshold intensity. However, Claim 1 broadly covers modifying without limitation to increasing. Therefore, Applicant submits that the claims themselves are to be rejected and not the summarization provided in page 3 and top of page 4 of the Office Action.

Thirdly, the Office Action appears to recognize only one aspect in which the teachings of Pierrat differ from those of the applicant. See the bottom of page 4 of the Office Action. As noted above in reference to Applicant's arguments against the anticipation rejection, there are other differences. For example, Pierrat's generic teaching of using a second mask, fails to suggest an issue of poorly defined regions that can arise even when using two masks, which is addressed by several explicit limitations recited in Applicant's Claim 1, e.g. determining a threshold intensity, for critical openings. Also as noted above, the Office Action does not show where does Pierrat teach such limitations (either explicitly or inherently).

Fourthly, the Office Action appears to state that Tsudaka teaches increasing the area of a critical opening, and cites to Tsudaka's claims 1-11. However, the cited text by

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Tsudaka (even when combined with Pierrat's patent) fails to teach the limitations in Applicant's Claim 1 for one or more of the four arguments which were made in the prior Amendment dated July 25, 2006 at pages 8-10. These four arguments from the prior Amendment are incorporated by reference herein in their entirety. As just one example of these previously-made arguments that continue to be relevant here, note that Tsudaka may teach use of a threshold intensity to generate contour lines from which spatial deviation of the design pattern is measured but this still fails to disclose or suggest deforming openings to provide radiation of at least threshold intensity, as per Claim 1. Specifically, Tsudaka's threshold intensity appears to be limited to generation of contours, and nothing else.

Fifthly, Pierrat's US Patent 6,821,689 and Cote et al's US Patent 6,787,271 are believed to be **disqualified** as prior art under §103(c) because the subject matters are commonly owned by the same entity at all relevant times. Specifically, Pierrat's US Patent 6,821,689, Cote et al's US Patent 6,787,271 as well as the current application were, at the time the invention of the current application was made, commonly owned by (or were under a duty of assignment to) the same entity, namely Numerical Technologies, Inc. and/or the 100% owner of Numerical Technologies, Inc. namely Synopsys, Inc (subsequent to March 1, 2003). This is supported by a review of the assignments of these two patents and the current patent application, which are not submitted herewith as they are readily available in the USPTO.

This argument is further supported by sworn statements made by the current patent application's inventor in paragraph [0027] on page 8 of Applicant's specification. To re-iterate, the statements in paragraph [0027] on page 8 are a part of the specification of the current patent application which was reviewed by inventor Armen Kroyan who executed a declaration for the current patent application (at the time of filing). Hence the current inventor's statements are believed to be sufficient evidence to disqualify commonly owned subject matter in at least US Patent 6,821,689 which is granted to Pierrat. This argument is believed to also disqualify commonly owned subject matter in US Patent 6,787,271 granted to Cote and Pierrat, because at the relevant times Cote and Pierrat and the current inventor, Armen Kroyan all worked for the same entity.

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Concluding Remarks

If the Examiner rejects any claim in a future Office Action over any prior art reference, the Examiner is respectfully requested to provide a ***pin-point citation*** in a prior art reference (by column and line number), for each and ***every individual claim limitation*** of the rejected claim, preferably in a claims chart format, so that an appropriate response can be filed.

For the above reasons, Applicant respectfully requests allowance of all pending claims. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8203.

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office to the fax number 571-273-8300 on January 3, 2007.

S. Omkar Jan 3, 2007
Attorney for Applicant(s) Date of Signature

Respectfully submitted,

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